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ABSTRACT

The ability of sixth-grade students to use context clues for identifying unknown words in science and social studies reading materials and the types of context clues most frequently used are examined. The 30 subjects from three white, middle-class urban schools missed 50 percent or more of the words on a prevocabulary test. The subjects read two articles in Reader's Digest Reading Skill Builder and then selected the correct meanings of 75 words taken from the articles. The Vocabulary-Context Aid Test was used to determine how well the subjects used six types of context clues (direct explanation, experience or familiar expression, comparison and contrast, synonym, summary, and reflection of mood or situation). Results of the study showed that (1) 13.3 percent of the subjects correctly identified 75 percent or more of the words, (2) 96.7 percent identified at least 50 percent of the words, (3) all subjects correctly identified at least 40 percent of the words, (4) experience or familiar expression was the context clue used most frequently, (5) summary was the context clue used least frequently, and (6) 32 percent of the subjects used the clues that the examiners had expected them to use. Tables and references are included. (VJ)

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AN ANALYSIS OF SIXTH GRADE PUPIL'S ABILITY TO USE CONTEXT CLUES IN SCIENCE AND SOCIAL STUDIES

by

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INTRODUCTION

Educators and researchers in the fields of reading and linguistics have emphasized the importance of a reader's ability to effectively use context clues as an aid to word recognition. It has been felt that the use of contextual aids is perhaps the reader's most important skill, for it is a rapid technique for immediate word recognition, and, acts as a check on the application of all the other recognition techniques. Linguists have further pointed out that "words shift their meanings under the pressure of the their contexts, and that it is important to see why words change meanings with their settings."[1]

Much of the research in the area of use of context clues to determine the meaning of an unknown word has been concerned with classifying the types of context clues; i.e., the categorization of responses of readers as to how they identified an unknown word. The purpose of this study was to analyze the effectiveness of sixth grade pupils' ability to use context clues as a means of identifying unknown words. Specifically, the study attempts to answer these two questions:

1. How effective are sixth grade pupils in their ability to use context clues in science and social studies reading material?

[1] Richards, I. A. "What Is Involved in the Interpretation of Meaning?" Reading and Pupil Development - Proceedings of the Conference on Reading Held at the University of Chicago, LI (1940), 49-55.

2. What types of context clues are the subjects most frequently using in order to identify the meanings of unknown words?

RELATED RESEARCH

Reading authorities and linguists have stated that context is an important determinant of word meaning and that the use of context clues should be a part of direct reading instruction. Attempts have been made to classify types of contextual aids that are used by readers in order to determine the meaning of unknown words in context.

Artley and McCullough (1943) both devised classification schemes, but the schemes were not directly based on research evidence.

Seibert (1945) asked college students to replace blanks in passages with words of the appropriate meaning, but he did not ask them to explain how they were making use of the contextual aids.

Deighton (1959) devised a classification based on passages he had studied for possible contextual aids, but he collected no data from readers as to how they were using context.

Ames (1965) sought to determine from the verbal responses of mature readers, the types of contextual aids they were using in replacing nonsense words in passages with words of appropriate meanings, and then to classify these contextual aids into a classification scheme.

In a modified replication of Ames' study using his classification scheme, Quealy (1969) found: that Ames' classification scheme, developed with graduate students, is also valid for senior high

school students; that intellectual ability, as measured by standardized tests, is highly related to effective use of contextual aids; and that the form classes to which words belong should be considered in designing instructional material using contextual aids.

Other early researchers were also aware of the importance of contextual aids. Thorndike, as early as 1917 in a classic study on reading as reasoning, stated that "a word may produce all degrees of erroneous meaning for a given context, from a slight inadequacy to an extreme perversion."

Strang (1944) conducted an exploratory study of the characteristic reactions of high school and college students to unfamiliar words in context. She concluded that the students had only a vague notion of the types of context clues or techniques for using them to ascertain the meaning of a word.

Werner and Kaplan (1950) investigated the processes underlying acquisition of word meaning through context. Among their results they found that "correct responses were closely related to the conventionalization of the word meanings used in context." Thus, if a child gave a correct meaning for an artificial word, it showed his power of logic, his experience, and his mastery of the English language.

McCullough (1958), from a review of research on word study in context, concluded that pupils must be helped to understand that context clues extend beyond the sentence in which the unknown word appears.

METHODOLOGY

Thirty, sixth grade male and female students from three white, middle-class urban schools served as subjects for the study. No students were selected to serve as subjects whose reading achievement was below fifth grade level in the fall of the year, as measured by the Stanford Achievement Test, Form W. Ninety students from the three schools were screened to determine a population of students who missed 50% or more of the social studies and science words on a pre-vocabulary test constructed from passages to be used later as a measure of context reading. The pre-vocabulary test included all the words that the subjects were asked to identify on the actual tests utilizing context clues. In order to select the final population of thirty children, the examiners chose ten students from the group who missed 50% or more of the words to serve as the subjects for the testing on the use of context clues. The average chronological age of the thirty subjects was 140 months with a standard deviation of 6.76 months. The subjects' intellectual ability ranged from I.Q. 87 to I.Q. 133 with a mean of 102 as measured by the Otis-Lennon Mental Maturity Test.

Testing Instruments Used in the Study

Instruments used in this study were:

(1) Otis-Lennon Mental Maturity Test

(2) Stanford Achievement Test, Form W, Intermediate Battery

(3) Pre-Vocabulary Screening Test

(4) Vocabulary-Contextual Aids Test

Pre-Vocabulary Screening Test

The pre-vocabulary screening test was used to determine knowledge of meanings of words selected from science and social studies articles in Reader's Digest, Reading Skill Builder, Grade 6 Reading Level, Part Three, pp. 31-36 and pp. 79-85, 1960. The pupils were to select the correct meanings of the words from the four choices next to each of the seventy-five words tested. The correct and incorrect item choices were determined by the examiners with regard to corresponding parts of speech and the dictionary definition. The pre-test measured in isolation all the vocabulary words that were to be used on the contextual tests in which the subjects had to determine the appropriate meanings of words from the context.

Vocabulary-Context Aids Test

The Vocabulary-Context Aid Test measured how well the children used six types of designated context aids to determine the meanings of twenty-five unknown words in science and social studies articles from the Reader's Digest, Reading Skill Builder. The twenty-five

words selected were those words missed by 50% of the students on the screening vocabulary test previously described. The six types of context clues are from the Strang, McCullough, and Traxler classification scheme.

PROCEDURES OF DATA COLLECTION

Each of the thirty subjects were tested individually on two reading selections. The science selection, "The Atomic Clock", and the social studies selection, "Voices Across the Land", were taken from the Reader's Digest, Reading Skill Builder, Book 6. Each subject read the two selections silently. The examiner then asked the subject to identify the meanings of the pre-selected words, and was asked the question, "How did you know what the word means?" Verbal responses were recorded by each examiner. A tabulation of the number of correct and incorrect responses was made, and the types of context clues used by the subjects were categorized according to Strang, McCullough, and Traxler's classification. Prior to the testing of the pupils, the examiners classified the twenty-five test words used in the article according to the type of context clue being utilized as indicated by the aforementioned classification scheme.

TREATMENT OF THE DATA AND RESULTS

In answering the question as to the ability of sixth grade pupils to effectively use context clues in social studies and science materials, it was found that 13.3% of the subjects were able to correctly identify 75% or more of the meanings of the twenty five words, and that 96.7% of the subjects identified at least 50% of the words. Since all the subjects correctly identified at least 48% of the words, it appears that they were able to effectively use context clues to derive the meanings of previously unknown words as measured by the pre-vocabulary test.

TABLE I

CORRECT AND INCORRECT RESPONSES ON THE VOCABULARY-CONTEXT AIDS TESTS
(N=30)

SUBJECT	#CORRECT	#INCORRECT	NO RESPONSE	%CORRECT
1	20	5		80%
2	17	8		68%
3	15	10		60%
4	17	8		68%
5	16	9		64%
6	15	10		60%
7	20	5		80%
8	16	9		64%
9	18	7		69%
10	17	8		68%
11	15	9	1	60%
12	14	11		56%
13	15	10		60%
14	18	7		72%
15	14	11		56%
16	13	12		52%
17	18	7		68%
18	12	13		48%
19	20	5		80%
20	14	11		56%
21	18	7		68%
22	16	8	1	64%
23	22	3		89%
24	17	7	1	68%
25	17	8		68%
26	15	10		60%
27	15	9	1	60%
28	16	9		64%
29	16	9		64%
30	17	8		68%

Of the six types of context clues; i.e., direct explanation (#1), experience or familiar expression (#2), comparison and contrast (#3), synonym or restatement (#4), summary (#5), and reflection of mood or situation (#6), clue #2 was the one most frequently indicated by the subjects as the context clue with which they determined the meaning of an unknown word in a sentence. The second most frequently used clue by the students was direct explanation. Reflection of mood or situation was the next in frequency of student use. It is interesting to note that clue #2, the one most frequently used by the subjects, was also the clue that teachers most often expected the pupils to use based on the frequency of occurrence of such clues in the passages. Clue #6, according to teacher expectation based on the types of words in the passages, was forseen to be used more often by the students than clue #1. However, the reverse of this expectation was indicated by the student's responses. It should further be considered that the teachers' expected responses did not take into account the total number of incorrect responses. Out of the total number of responses given (750), 257 or 34% of the responses were incorrect.

TABLE 2

TEACHER EXPECTATION OF CLUE USE VERSUS NUMBER OF TIMES CLUES USED BY SUBJECTS

Type of clue	# of times expected by teachers	# of times used by subjects
#1 (direct expl.)	120	93
#2 (experience)	330	276
#3 (comparison & contrast)	60	18
#4 (synonym or restatement)	60	29
#5 (summary)	0	10
#6 (reflec. or mood or sit.)	180	63
Incorrect responses	0	257
No response	0	4

note expectancy and use of clues determined by multiplying the number of times a clue was used in the passages by the number of students. Ex: clue #1 was used, as expected by the examiners, 4 times in the passages. 4 multiplied by the number of students (30) gives 120.

The least used clue to identify unknown words, as indicated by both examiners and subjects, was clue #5 (summary). This clue was given 0 expectance by the examiners and was utilized in ten instances by the subjects. Clue #3 (comparison and contrast), the second least clue used by the subjects, was given a fairly higher expectancy rate of use by the examiners. Table 3 presents the overall percentages for the expected clue to be used according to the examiners versus the times such clue was actually used by the subjects.

TABLE 3

EXPECTED CLUES ACCORDING TO EXAMINERS VERSUS # OF TIMES USED BY SUBJECTS

Word	Clue expected by examiners	% of times used by sub.
aplicing	# 2	7%
hoists	# 2	20%
million	# 2	63%
via	# 6	43%
A.T. and T.	# 1	73%
monopoly	# 3	3%
object (verb)	# 4	37%
practically	# 3	57%
efficiency	# 6	23%
dimensions	# 6	30%
Geiger Counter	# 2	30%
atomic	# 2	17%
radioactive	# 2	23%
fascinating	# 6	10%
universe	# 2	80%
lotus	# 1	73%
Cosmic Rays	# 2	40%
nitrogen	# 2	63%
absorb	# 6	27%
carbon dioxide	# 2	70%
reveal	# 2	57%
contribution	# 6	3%
civilization	# 1	10%
crude	# 1	13%
substance	# 4	40%

32% of the time the subjects used the clue that the examiners had expected.

The subjects used the expected clues as indicated by the examiners 32% of the time. Although the overall correspondence of expected and used clues was 32%, this finding again does not take into account the 34% of incorrect responses.

In discussing the overall findings, it should be considered that the instrument did not provide for the maximum use of all types of context clues. This fact may be due to the type and level of reading materials that was used in the study. Further, the types of clues available to determine the words were based on the subjective evaluation of the examiners according to the Strang, McCullough, and Traxler classification scheme. Therefore, the examiners' classification as to expected clues was the only criteria used to determine the type of clue to be used by the subjects.

Table 4 presents the overall results of the study as to the number and percentage of times each type of context clue was used by the subjects.

TABLE 4

AND % OF TIMES CLUES USED BY SUBJECTS AS COMPARED TO THE EXPECTED CLUES

Word	expected clue	direct exp. #1	%	exp. #2	%	comp. & contrast #3	%	syn. #4	%	summary #5	%	roll of mood #6	%	incorrect responses	%	no responses	%
splicing	2	0	0	2	7	0	0	0	0	0	0	0	0	28	93	0	0
hoists	2	11	37	6	20	0	0	0	0	1	3	2	7	10	33	0	0
million	2	0	0	19	63	0	0	0	0	0	0	0	0	11	37	0	0
via	6	2	7	1	3	0	0	0	0	0	0	13	43	14	47	0	0
A.T. and T.	1	23	73	4	13	0	0	1	3	0	0	2	7	0	0	0	0
monopoly	3	0	0	3	10	1	3	0	0	0	0	2	7	23	77	1	3
object (verb)	4	1	3	17	57	0	0	11	37	0	0	1	3	0	0	0	0
practically	3	3	10	8	27	17	57	0	0	1	3	0	0	1	3	0	0
efficiency	6	2	7	1	3	0	0	1	3	0	0	7	23	19	63	0	0
dimensions	6	0	0	6	20	0	0	0	0	0	0	9	30	14	47	1	3
Geiger Counter	2	4	13	9	30	0	0	0	0	5	17	0	0	11	37	1	3
atomic	2	0	0	5	17	0	0	2	7	0	0	0	0	23	77	0	0
radioactive	2	2	7	7	23	0	0	0	0	1	3	0	0	19	63	1	3
fascinating	6	1	3	20	67	0	0	0	0	0	0	3	10	6	20	0	0
universe	2	0	0	24	80	0	0	0	0	0	0	0	0	6	20	0	0
lotus	1	22	73	3	10	0	0	0	0	0	0	0	0	5	17	0	0
Cosmic Rays	2	5	17	12	40	0	0	0	0	0	0	1	3	12	40	0	0
nitrogen	2	2	7	19	63	0	0	0	0	0	0	5	17	4	13	0	0
absorb	6	0	0	19	63	0	0	1	3	0	0	8	27	2	7	0	0
carbon dioxide	2	5	17	21	70	0	0	0	0	0	0	1	3	3	10	0	0
reveal	2	2	7	17	57	0	0	0	0	1	3	5	17	5	17	0	0
contribution	6	1	3	19	63	0	0	0	0	1	3	1	3	8	27	0	0
civilization	1	3	10	16	53	0	0	1	3	0	0	1	3	9	30	0	0
crude	1	4	13	7	23	0	0	0	0	0	0	2	7	17	57	0	0
substance	4	0	0	11	37	0	0	12	40	0	0	0	0	7	23	0	0
TOTAL		93		276		18		29		10		63		257		4	

CONCLUSIONS

The data analyzed have yielded information from which the following conclusions may be drawn:

1. 13.3% of the subjects were able to correctly identify 75% or more of the meanings of the twenty-five words in context.
2. 96.7% of the subjects identified at last 50% of the words in context.
3. All subjects correctly identified the meanings of at least 48% of the words in context.
4. Context clue #2 or experience or familiar expression was the clue most frequently used by the subjects to determine the meanings of unknown words in context.
5. Context clue #5 or summary was the least frequently used clue by the subjects.
6. 32% of the time the subjects used the clues that the examiners had expected them to use based on the types of words used in the passages.

EDUCATIONAL IMPLICATIONS

It appears from the reuslts of this study that generally the subjects were effectively able to use context clues in order to determine the meanings of unknown words in context. When these same unknown words were previously presented to the subjects in isolation on the pre-vocabulary test, many of the words were missed by the same subjects who responded correctly to their meanings on the contextual aids test.

Therefore, the ability to use context appears to be a powerful aid for the reader in determining the meanings of unknown words in context.

The results of the study also point up the importance to the reader of having an adequate background of experiences to aid him in determining unknown word meanings. Since this type of context clue most often appeared in the reading material and was most often used by the subjects, its persuasiveness and usability must be noted. Having the concepts and experiences to back up the topic of the reading material may perhaps be the most important type of contextual aid available to the reader. Therefore, instructionally, experiences and concepts exist to some degree in the reader's cognitive domain before the reading material may become meaningful to him. Teachers must therefore not assume that the students have a priori the necessary concepts and experiences dealing with a certain science or social studies topic, but must first teach to those concepts before maximum meaningful reading can be achieved.

Further, since context clues appear to be such a help to the reader, giving pupils specific instruction and practice in how to use a variety of context clues might further facilitate their handling of unknown words in context. The overall results of this study indicate that intermediate pupils can and do use contextual aids, but greater instructional emphasis in this area might increase their ability for maximum effectiveness in meaningful word recognition.

Considering the results of this study, further research with subjects of different ages, abilities, and socio-economic statuses would seem justified. Future research might also deal with different types of reading material varying the style, complexity, and topic of the passages in order to see if different types of contextual aids are used in varying degrees in the different materials. Parts of speech might also be another factor in determining the types and complexity of context clues that a reader uses.

Note #1 Copies of the Pre-Vocabulary Selection Test and the Vocabulary-Contextual Aids Tests may be obtained by writing to the author

Note #2 The author would like to thank the following graduate students for participating in this study: Evelyn Clegg, Katherine Gresham, Priscilla Holman, Frances Rackley, Beebe Roberts, Eloise Smith and Melisa Tate.

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